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TITLE: PRODUCTION OF LIQUEUR

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ABSTRACT:

PROBLEM TO BE SOLVED: To produce a liqueur, having a strong fresh and aged flavor, hardly causing rough tastes such as astringency, having a mellow taste, excellent in palatability and useful for health, etc., by immersing fruits, etc., in a raw sweet Sake (a Japanese fermented, mildly alcoholic beverage made from rice).

SOLUTION: This liqueur is produced by immersing one or more selected from fruits, herbs, spices and Chinese crude drugs in a sweet Sake liquid obtained from an aged unrefined sweet Sake produced by adding an enzymic agent into a brewing step for the sweet Sake. The fruits in an amount of 1-50 pts.wt. based on 1 pt.wt. raw sweet Sake are preferably immersed therein.

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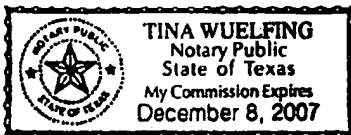
This is to certify that a professional translator on our staff who is skilled in the Japanese language translated the enclosed Kokai Patent Application No. 10[1998]-262641 from Japanese into English.

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Subscribed and sworn to before me this 10th day of February, 2004.



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METHOD FOR PRODUCTION OF LIQUEUR

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[There are no amendments to this patent.]

## Abstract

### Problem

The problem of the present invention is to provide a method for production of liqueurs with excellent flavor.

### Means of solution

Fruits, herbs, spices, etc., are steeped in raw mirin [sweet sake] to extract the flavor, etc.

### Claims

1. A method for production of a liqueur characterized by the fact that one or more materials selected from fruits, herbs, spices, and herbal medicines are steeped in raw mirin.
2. The method for production of a liqueur described in Claim 1 in which the raw mirin is mirin juice obtained from unrefined aged sweet sake produced by adding an enzymatic agent during brewing of the mirin.

### Detailed explanation of the invention

[0001]

#### Technical field of the invention

The present invention pertains to a method for production of a new type of liqueur.

[0002]

#### Prior art

Traditionally, liqueurs produced by steeping raw fruits or herbal medicines (medicinal materials) in low-class distilled spirits or white liquor with sugar and extracting the flavor have been used as health drinks with high storage stability. For example, in the manufacture of common ume [plum] brandy, for 1 kg of ume [plums] washed and wiped clean of moisture, 0.8 kg of crystallized sugar, and 1800 mL of white liquor (35°) are poured into a vat and sealed, then stored for several months to extract components of the ume fruit, and in some cases, addition of approximately 400 mL of honey is proposed, or mixing of mirin is proposed (Full-Color (Illustrated) Book of Plants, p.150, Kenpaku Co., 1974 First edition).

[0003]

Furthermore, the process of steeping plums or other fruits directly in natural mirin has been proposed as well (Japanese Kokai Patent Application No. Hei 6[1994]-153897), but the taste relies on flavor based on honey or sweet ingredients such as sugars included in the mirin, or flavor based on amino acids, etc. In particular, Japanese Kokai Patent Application No.

Hei 6[1994]-153897 states that the flavor components included in mirin are essential to the production of a fruit liqueur with good flavor, and a thermally pasteurized commercial fruit liqueur is used in application examples to illustrate the point. On the other hand, for liqueurs maintained as herbal medicines (medicinal materials), a method for steeping kuko [Chinese matrimony vine], jujube [Chinese date], ginseng, garlic, etc. in white liquor was introduced in detail by Hisao Oitate, "Herbs and Healthy Cooking" (Vol. 3, pp. 63-72, Kyoto Shoin, 1990 First edition).

[0004]

Problems to be solved by the invention

However, the fresh taste of raw fruit cannot be expected in a liqueur with raw fruit steeped in it and when citrus fruit is used, an intense bitterness has been pointed out as a crucial deficiency of the drink. Furthermore, unpleasant scents unique to herbal medicines are overwhelming in liqueurs that maintain herbal medicines, and a pleasant drink is not necessarily obtained. In fact, those that are regarded as better for good health have a greater unpleasant taste.

[0005]

The aforementioned quality deficiency is the same when herbs and spices are used and the unpleasant taste is intensified. Therefore, keeping fresh flavor in a liqueur when raw fruits are used and taking advantage of each unique flavor in liqueurs when herbal medicines, herbs, and spices are used and preventing formation of unpleasant scents are important topics. Furthermore, an aging period of at least one month, and in general, 6 months to 1 year, is required until the product is ready for tasting, and the time period is too long for industrial production. In addition, the included raw materials of fresh fruits, herbs, and spices are expensive materials; thus, the cost is directly influenced by the efficiency of extraction from the raw materials, and the extraction efficiency is poor.

[0006]

Means to solve the problem

The present inventors focused on new areas that have rarely been touched in the past, namely, the flavor, production period, and extraction efficiency of the aforementioned liqueurs, and as a result of much research conducted by the inventors, they discovered that the aforementioned existing problems can be completely eliminated when fruits are steeped in raw mirin, and as a result, the present invention was accomplished.

[0007]

**Embodiment of the invention**

The present invention is explained further in specific terms below. The raw mirin used in the present invention is mirin juice produced by press filtering standard, aged, unrefined sake of mirin prepared by mixing low class distilled spirits or alcohol with malted rice and steamed sweet rice, adding an enzymatic agent such as amilase, as needed, and aging for 30 to 60 days at 25 to 30°C. Commercial mirin is produced by thermally pasteurizing and sterilizing the aforementioned mirin juice, but in the present invention, mirin juice before thermal pasteurization and sterilizing, that is, raw mirin is used. Unlike thermally pasteurized mirin, raw mirin contains malted rice and enzymes based on enzymatic agents added during the brewing process. In this case, raw mirin produced by adding enzymatic agents during the brewing process is desirable. Furthermore, a juice produced by forming steamed sweet rice into a liquid with an enzymatic agent ahead of time, charging the juice in alcohol with malted rice to convert to sugar, followed by aging and pressing may be used, as well.

[0008]

One or more materials can be selected from the group consisting of fruits such as plums, Chinese quince [*Chaenomeles sinensis*], lemon, and citron, spices such as garlic, ginger, ajowan, allspice, cardamon, caraway, and cinnamon, herbs such as jasmine, rosemary, mint and sage, herbal medicines such as kuko, longan [*Nephelium longanum*], ginseng, tsuyushiba, dried orange peel and Chinese quince for the above-mentioned raw mirin. The aforementioned materials are hereinafter referred to as fruits, etc. The fruit, etc. steeped in the raw mirin are used as they are, or after being cut or crushed and are added at a ratio of 1 to 50 parts by weight for 1 part raw mirin. In this case, the steeping temperature is 5 to 50°C.

[0009]

The higher the steeping temperature used, the more effective the extract flavors, but evaporation of alcohol in the raw mirin increases, as well; thus, sealing of the steeping container, etc. is required. After [the fruit, etc. are included] in the aforementioned raw mirin, the flavor of fruit, etc. is extracted and transferred to the raw mirin as the steeping process is continued for 7 days to 30 days with gentle stirring provided, at times, as needed. Subsequently, the fruit, etc. is removed through filtration, etc. as needed, and sterilization follows to produce the liqueur. In addition, the liqueur of the present invention can be used as a seasoning as in the case of standard mirin.

[0010]

Effect of the invention

According to the present invention, the fruit liqueur has a fresh and pleasant flavor, an after-taste such as bitterness is absent, and a smooth taste can be achieved. In particular, a liqueur with a lesser degree of bitterness can be produced when citrus fruits such as citron, grapefruit, or lemon is used. Furthermore, the intense flavor unique to the raw material can be controlled in liqueurs containing spices and herbs and a mellow and fresh flavor can be achieved and mellow liqueur can be produced. And furthermore, in addition to the enhancement of flavor, extraction of the material is promoted by the enzymatic agent included in the raw mirin and the aging time can be reduced, and it is possible to produce a mellow liqueur with good flavor in 14 days at 25°C even in the case of plum liqueur, which is said to take 3 to 6 months.

[0011]

Application examples

Application Example 1

1,000 kg of polished sweet rice were washed, soaked, and drained in the usual manner, and steamed to produce 1,400 kg of steamed sweet rice. The aforementioned steamed sweet rice was charged into 720 L of 40% alcohol with 200 kg of malted rice; then, saccharification and aging were provided for 60 days at 25°C; then, pressing was done and the result allowed to sit for 5 days at 25°C, and then, the supernatant was filtered to produce raw mirin. Heating was provided for a portion of the aforementioned raw mirin for 20 sec at 115°C by a plate heater to produce a thermally pasteurized mirin. The spices and herbs (commercial products) listed in Table 1 below were placed in the above-mentioned raw mirin and thermally pasteurized mirin at the ratio shown in Table 1 and steeping was done at 10°C for 15 days. Subsequently, solids were removed, and heating was done at 80°C to sterilize and to produce liqueur. When the liqueurs produced were tasted by 10 testers, the liqueurs produced by steeping in raw mirin were preferred by most.



[0012]

Table 1

浸漬物 ①	みりん使用量 ② (ml)	浸漬物重量 ③ (g)	好ましいと評価したパネル(人) ④	
			生みり <sup>5</sup>	火入れみりん <sup>6</sup>
⑦ アニス	1400	400	8	2
⑧ バジル	1700	120	10	0
⑨ カルダモン	1400	250	7	3
⑩ クローブ	1400	400	7	3
⑪ コリアンダー	1200	800	8	2
⑫ フェンネル	1400	300	6	4
⑬ ジンジャー	1400	300	9	1
⑭ ローレル	1600	100	6	6
⑮ メース	1700	100	7	3
⑯ マジョラム	1600	100	8	2
⑰ オレガノ	1600	150	8	2
⑱ スターアニス	1600	120	6	4
⑲ タラゴン	1600	100	9	1
⑳ タイム	1600	150	9	1
㉑ サフラン	1200	25	5	5

- Key:
- 1 Material steeped
  - 2 Amount of mirin used (mL)
  - 3 Weight of preserve (g)
  - 4 Number of testers (persons) evaluating as desirable
  - 5 Raw mirin
  - 6 Thermally pasteurized mirin
  - 7 Anise
  - 8 Basil
  - 9 Cardamon
  - 10 Cloves
  - 11 Coriander
  - 12 Fennel
  - 13 Ginger
  - 14 Bay leaf
  - 15 Mace
  - 16 Marjoram
  - 17 Oregano
  - 18 Star anise
  - 19 Tarragon
  - 20 Thyme
  - 21 Saffron

[0013]

Application Example 2

1,000 kg of polished sweet rice were washed, soaked, and drained as usual, and steamed to produce 1,400 kg of steamed sweet rice. The aforementioned steamed sweet rice was charged into 720 L of 40% alcohol with 200 kg of malted rice and 100 g of enzymatic agent ( $\alpha$ -amylase 800, product of Ueda Chemicals); then, saccharification and aging were provided for 60 days at 25°C, then, pressing was done and the result allowed to sit for 5 days at 25°C, and then, the supernatant was filtered to produce raw mirin. Heating of a portion of the aforementioned raw mirin was done for 20 sec at 115°C by a plate heater to produce a thermally pasteurized mirin. 50 kg each of citron sliced into eighths were added to 100 kg of the above-mentioned raw mirin and thermally pasteurized mirin, the temperature of the material was retained at 25°C and gentle stirring was provided once every two days to maintain uniformity. After 12 days, solids were removed, an analysis was made of each solution by Head Space Gas Chromatography of Hewlett Packard (HP), and at the same time, a sensory test was conducted. The results obtained are shown in Table 2 below.

[0014]

Table 2

① フレーバー成分 (ガスクロマトグラフ) (*1)						
R.T. (*2)	2.11	3.86	4.08	11.33	11.76	21.42
② 生みりん浸漬	157.6	64.0	127.0	523.6	100.3	213.9
③ 火入れみりん浸漬	104.9	53.2	32.1	460.6	9.7	202.7
④ 官能評価						
② 生みりん浸漬	すっきりしたゆずの香りが強く感じられる。僅かに苦味を感じられるが、全味は穏やかで美味しい。⑤					
③ 火入れみりん浸漬	ゆずの香りがあるが弱い。反而苦味が強い。⑥					

- Key: 1 Flavor component (Gas chromatography chart area) (\*1)  
 2 Steeped in raw mirin  
 3 Steeped in thermally pasteurized mirin  
 4 Sensory test  
 5 Intense fresh fragrance of citron noted. Slight bitterness exists, but flavor is good and mellow.  
 6 Fragrance of citron weak. Bitterness is strong.

[0015]

\*1: Head Space Sampler (HP7694) of HP Corp. was used for the analysis of the flavor component, and 5 g sample were placed in a 20 mL vial and sealed; then, this was heated for 20 min at 80°C, and 1 mL of head space gas was extracted under applied pressure. It was then introduced to the direct gas chromatograph (HP6890), DB-WAX (HP) was used as the column, He (1 mL/min) was used as the carrier gas, 35 to 150°C was used for the column temperature (temperature increase at 4.5°C/min, 5 min hold at 150°C), 120°C was used for the Inj. temperature, 200°C was used for the Det. temperature, and H<sub>2</sub> (30 mL/min) and Air (88 mL/min) were used for detection (FID) and an analysis was made.

\*2: Retention time (min)

As shown in the results obtained above through gas chromatography, the flavor peak area of the liqueur steeped in raw mirin was higher than that of the thermally pasteurized mirin, which indicates high extraction of the flavor and the sensory evaluation results were excellent as well.

[0016]

#### Application Example 3

50 kg lemons cut into eighths were added to the raw mirin and thermally pasteurized mirin (100 kg) produced in Application Example 2, the temperature of the material was kept at 25°C, and gentle stirring was provided once every two days to maintain uniformity. After 20 days, a flavor analysis was done for each solution as in the case of Application Example 2, and a sensory test was done. The results obtained are shown in Table 3 below.

[0017]

Table 3

① フレーバー成分 (g/100g 抽出液)					
R.T.	3.82	4.04	10.17	11.27	12.69
② 生みりん浸漬	93.9	203.5	7.8	367.5	32.2
③ 火入れみりん浸漬	29.0	20.7	3.7	177.0	14.7
④ 官能評価					
② 生みりん浸漬	⑤ レモンのフレッシュな香りが立つ。苦味は少なく、美味しい。				
③ 火入れみりん浸漬	⑥ レモンの香りがほとんどしない。苦味が強い割には味がうすい。				

- Key:
- 1 Flavor component (Gas chromatography chart area)
  - 2 Steeped in raw mirin
  - 3 Steeped in thermally pasteurized mirin
  - 4 Sensory evaluation
  - 5 Fresh fragrance of lemon noted. Slight bitterness noted, but flavor is good.
  - 6 Fragrance of lemon is hardly noted. Flavor is not strong despite strong bitterness.